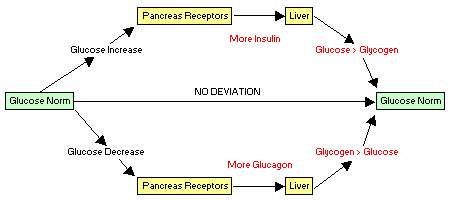
**Blood / Sugar Regulation**

The body requires volumes of glucose in order to create ATP. The amount of ATP demanded will fluctuate, and therefore the body regulates the availability of glucose to maximise its energy making potential.

Two hormones are responsible for controlling the concentration of glucose in the blood. These are insulin and glucagon. The diagram illustrates the principle of negative feedback control in action involving blood/sugar levels.



**Pancreas Receptors**

The receptors of the pancreas are responsible for monitoring glucose levels in the blood, since it is important in every cell for respiration.

Two types of cell release two different hormones from the pancreas, insulin and glucagon. These hormones target the liver, one or the other depending on the glucose concentration

* In cases where glucose levels increase, less glucagon and more insulin is released by the pancreas and targets the liver
* In cases where glucose levels decrease, less insulin and more glucagon is released by the pancreas and targets the liver

**The Liver**

The liver acts as a storehouse for glycogen, the storage form of glucose. When either of the above hormones target the liver, the following occurs

* **Insulin** - Insulin is released as a result of an increase in glucose levels, and therefore promotes the conversion of glucose into glycogen, where the excess glucose can be stored for a later date in the liver
* **Glucagon** - Glucagon is released as a result of an decrease in glucose levels, and therefore promotes the conversion of glycogen into glucose, where the lack glucose can be compensated for by the new supply of glucose brought about from glycogen

**Diabetes**

Diabetes insipidus is a condition where excess urine is excreted caused by the sufferers inability to produce ADH and promote the retention of water.

Diabetes Mellitus is another form of diabetes where the sufferer does not have the ability to produce sufficient insulin, meaning that glucose cannot be converted into glycogen. Anyone who has this condition usually has to take injections of insulin after meals and snacks to maintain their storage of glucose needed in emergencies.

**Fight or Flight**

In emergencies, adrenaline is released by the body to override the homeostatic control of glucose. This is done to promote the breakdown of glycogen into glucose to be used in the emergency. These emergencies are often known as 'fight or flight reactions'.

Adrenaline is secreted by the adrenal glands. The secretion of it leads to increased metabolism, breathing and heart rate. Once the emergency is over, and adrenaline levels drop, the homeostatic controls are once again back in place